Logistics

At the top right corner of your screen:

Show your control panel to submit questions and see answers

All phones/microphones are muted for the duration of the webinar.

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Control Panel:

Attendee List

Audio: please choose between speakers and telephone. If you do not hear audio right now, please check your speaker volume or enter #[audio pin]# if using phone.

Submit questions in the Questions box at any time, and press [Send]. To undock and increase the size of the box, click on top right corner icon.

Smart Management for Small Water Systems

WEBINAR: Find Money in the Water System Budget: Paying for Energy Improvements

Wednesday, June 16, 2015
2:00 – 3:00 PM EDT

This program is made possible under a cooperative agreement with EPA.

EFCN environmental finance center network

American Water Works Association

UNC ENVIRONMENTAL FINANCE CENTER

Environmental Finance Center Syracuse University

About the Environmental Finance Center Network (EFCN)

The Environmental Finance Center Network (EFCN) is a university-based organization creating innovative solutions to the difficult how-to-pay issues of environmental protection and improvement. The EFCN works with the public and private sectors to promote sustainable environmental solutions while bolstering efforts to manage costs.

The Smart Management for Small Water Systems Program

This program is offered free of charge to all who are interested. The Project Team will conduct activities in every state, territory, and the Navajo Nation. All small drinking water systems are eligible to receive free training and technical assistance.

What We Offer

Individualized technical assistance, workshops, small group support, webinars, eLearning, online tools & resources

- Environmental Finance Center at University of Louisville
- Environmental Finance Center at University of Maryland, College Park
- **Environmental Finance Center at University of North Carolina at Chapel Hill**
- Environmental Finance Center at Wichita State University
- EFC West
- Great Lakes Environmental Finance Center at Cleveland State University
- New England Environmental Finance Center at University of Southern Maine
- Southwest Environmental Finance Center
- **Syracuse University Environmental Finance Center**

New England Environmental Finance Center

Environmental Finance Center Syracuse University

EFC

UNC Environmental Finance Center

University of Louisville Center for Environmental Policy & Management

Great Lakes Environmental Finance Center

Southwest Environmental Finance Center

Wichita State University Hugo Wall School of Public Affairs Environmental Finance Center

EFCWest Environmental Finance Center West

Areas of Expertise

- Asset Management
- **Energy Use and Efficiency**
- Meeting Regulatory Compliance
- Fiscal Planning and Rate Setting
- Multi-funding Coordination
- Communications and Decision-making
- Water Loss Reduction
- Working with Other Water Systems
- Financing
- Funding Programs
- Managing Small Utilities in Drought

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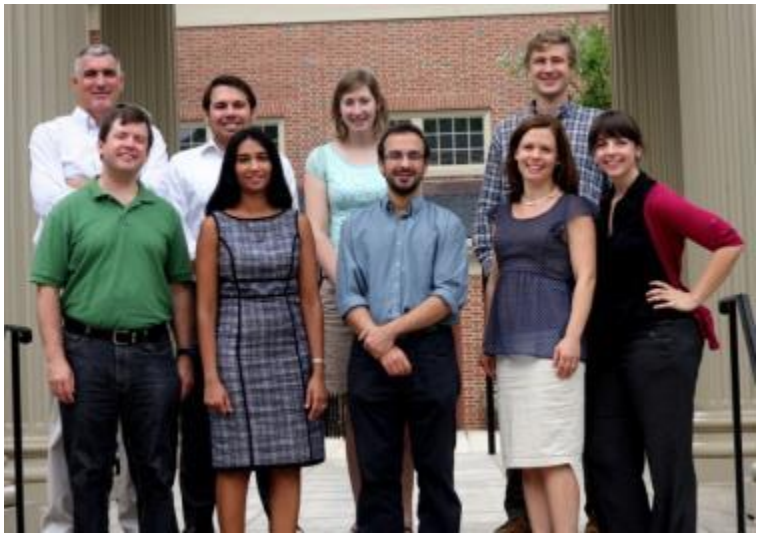


UNC SCHOOL *of* GOVERNMENT

Dedicated to enhancing the ability of governments and other organizations to provide environmental programs and services in fair, effective, and financially sustainable ways through:

- Applied Research
- Teaching and Outreach
- Program Design and Evaluation

How you pay for it matters

Find Money in the Water System Budget: Energy Management (E.M.) Webinar Series

#1: E.M. Planning for Small Water Systems and the NYSERDA Model (12/02/2014)

#2: E.M. Teams, Baselines, and Data Collection (03/03/2015)

#3: E.M. Project Ideas, Prioritization Methods, and Implementation Planning (06/09/2015)

#4: Paying for Energy Improvements (09/16/2015)

Speakers for Today's Webinar

- **Cory Cox**, Public Utilities Director, City of Pickens, South Carolina
- **Frank Shepard**, PE, LEED AP, Consultant with Shultz Engineering Group; Associate with Ally Engineering
- **Glenn Barnes**, Senior Project Director, UNC Environmental Finance Center
- **David Tucker**, Project Director, UNC Environmental Finance Center

Agenda for Today's Webinar

Topic
Welcome and Logistics *David Tucker, Glenn Barnes, and Lisa Ruggero*
Overview of How to Pay for Energy Management Projects, with a Focus on Energy Savings Performance Contracting (ESPC) *David Tucker*
Energy Savings Performance Contracting: The Perspective from an Energy Services Company (ESCO) Professional *Frank Shepard*
Energy Savings Performance Contracting: The Perspective from a Local Government Small Drinking Water System (City of Pickens, South Carolina) *Cory Cox*
Question & Answer Session and Wrap-Up

Polling Question 1

What kind of drinking water utility do you represent? *(choose one)*

- For-Profit Water Utility
- Local Government (Municipal or County)
- Not-for-Profit / Cooperative / Association
- Other H2O Util. (Authority, District, School, Hotel, etc.)
- Not a Drinking Water Utility

Polling Question 2

What size drinking water system does your utility operate (by number of people served)? *(choose one)*

- Very Small (500 or fewer people served)
- Small (501 to 3,300 people served)
- Medium (3,301 to 10,000 people served)
- Large or Very Large (10,001 or more people served)
- Not a Drinking Water Utility

Polling Question 3

For energy savings performance contracting (ESPC), used to finance energy projects at your water utility, have you? *(choose one)*

- Never heard of ESPC before now.
- Have heard of ESPC but have not done one yet.
- Our utility is currently doing an ESPC.
- Our utility has completed an ESPC. What do we do next?
- Not a Drinking Water Utility.

Energy Management for Small Water Systems

Find Money in the Water System Budget: Paying for Energy Improvements

David Tucker, Environmental Finance Center at the University of North Carolina at Chapel Hill

Ways to Pay

- Pay as you go (current receipts)
- Save in advance and pay (fund balance, capital reserve fund)
- Pay later (someone loans you money)
- Grants (let someone else pay)

The Best Way to Pay? It Depends

- Pay as you go } Best for small energy improvements
- Fund balance
- Pay later } Best for large energy improvements
- Grants

http://www.dsireusa.org/

What is an Energy Upgrade?

- An energy upgrade to water or wastewater system is really just a **capital improvement**

- You can treat energy upgrades just like any other capital improvement

Where Capital Funding Comes From

- Rates / Monthly bills
- Special assessments to current customers
- Impact fees to new customers
- Debt Market, including State Revolving Funds
- Grants
- Or any way that your system gets revenue

What is an Energy Upgrade?

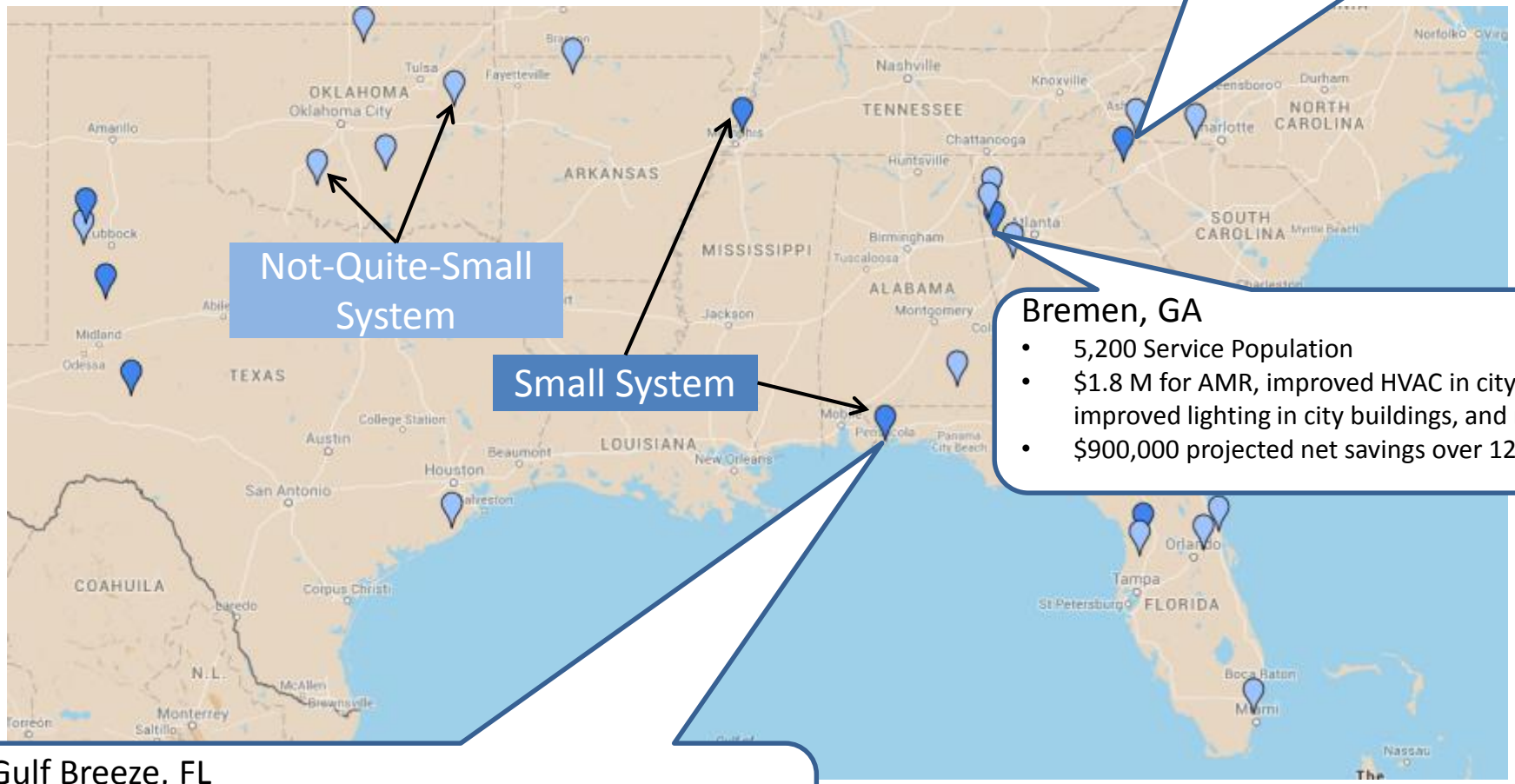
- An energy upgrade to a water or wastewater system is also a **special capital improvement**

- As a result, there are special financing options available for energy upgrades

Energy Savings Performance Contracting (ESPC)

Small Systems ESPC Examples

Pickens, SC
- 9,569 Service Population
- $ 5 M for AMR and new pumps
- $ 2.5 M projected net savings over 15 years



Bremen, GA
- 5,200 Service Population
- $1.8 M for AMR, improved HVAC in city hall, improved lighting in city buildings, and more
- $900,000 projected net savings over 12 years

Gulf Breeze, FL
- 5,763 Service Population
- $4.9 M for AMI, improved HVAC in city hall, and LED parking lights
- $1.2 M projected net savings over 12 years

What is Performance Contracting

- ESCO proposes and designs a package of energy cost reduction measures, installs or implements those cost reduction measures, and guarantees the savings of the cost reductions.
- ESCO may put up all of the capital for the energy projects

Source: Len Hoey, N.C. State Energy Office

What is Performance Contracting

- The ESCO pays itself back for the package over time using the stream of revenue provided by the energy reduction measures.
- Third party verifies ESCO reconciliation report.

Source: Len Hoey, N.C. State Energy Office

Why not do it yourself?

- Often opportunities to reduce energy costs are well known but owners are unable to take advantage of them
  - Capital
  - Expertise
  - Manpower
- Can you guarantee the savings?

Source: Len Hoey, N.C. State Energy Office

Performance Contracting Advantages

- A process with a single point of responsibility (rather than multiple contractors for various projects)
- Provides you with the ESCO's capital
- Provides you with the engineering and project management expertise of the ESCO
- Guaranteed performance / savings

Source: Len Hoey, N.C. State Energy Office

Steps to a Successful Project

- Assemble stakeholders
- Create data packet for project (application)
- Issue RFP
- Evaluate responses (select ESCO)
- Perform IGA
- Negotiate contracts
  - ESCO contract
  - Financial contract (in some cases)
- For govt. agencies: get approval from appropriate government agency

Source: Len Hoey, N.C. State Energy Office

Measurement & Verification

- Actual savings measured are compared to guaranteed savings by third party.
- If actual savings less than guaranteed savings, ESCO pays the difference to the governmental unit.
- The cost of the required third party M&V review is to be included in the contract.

Source: Len Hoey, N.C. State Energy Office

Performance Contract Concept

Quick Payback

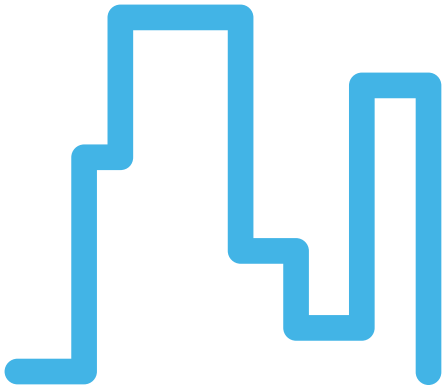
Energy Conservation Measures

- Lighting retrofits
- EMS

Long Payback

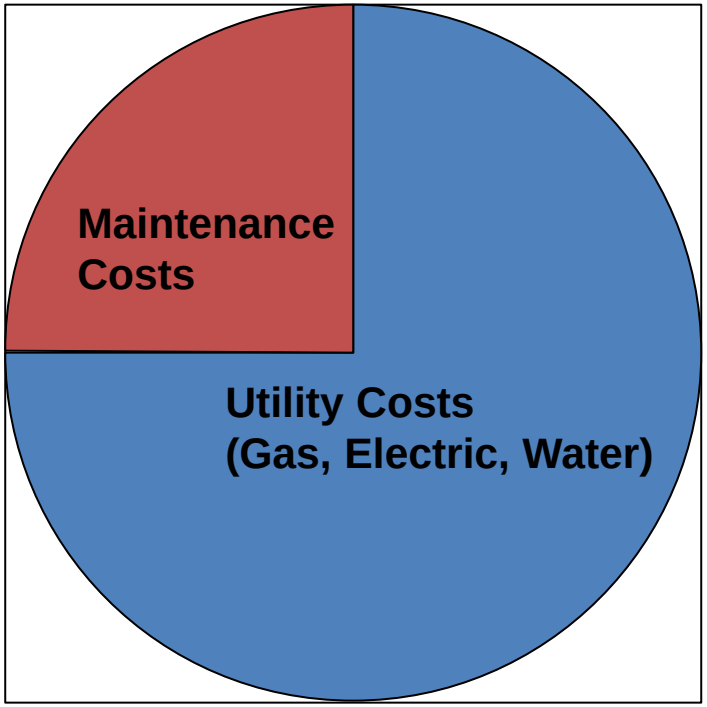
Major Building Improvements

- HVAC Upgrades
- Pumps
- Solar thermal/PV

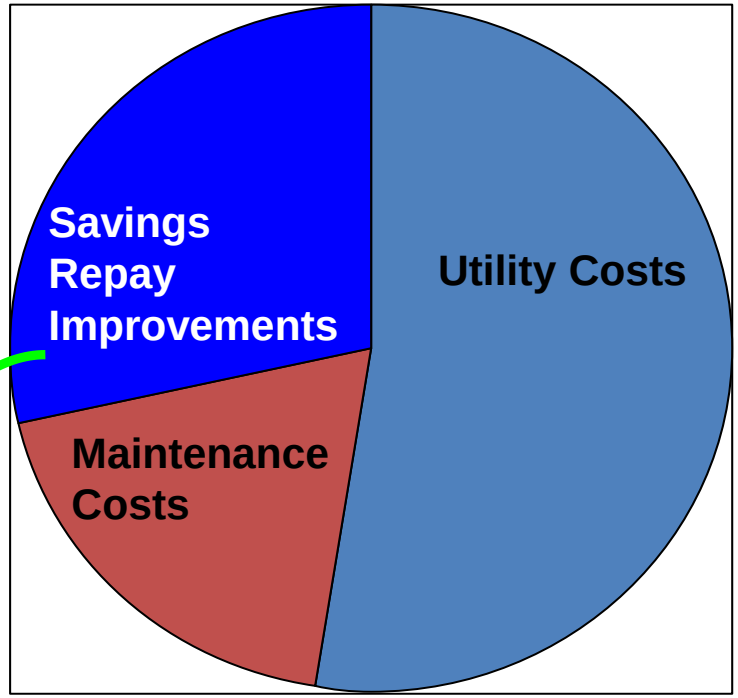


Comprehensive Facility Improvement Project

Annual Operating Budget

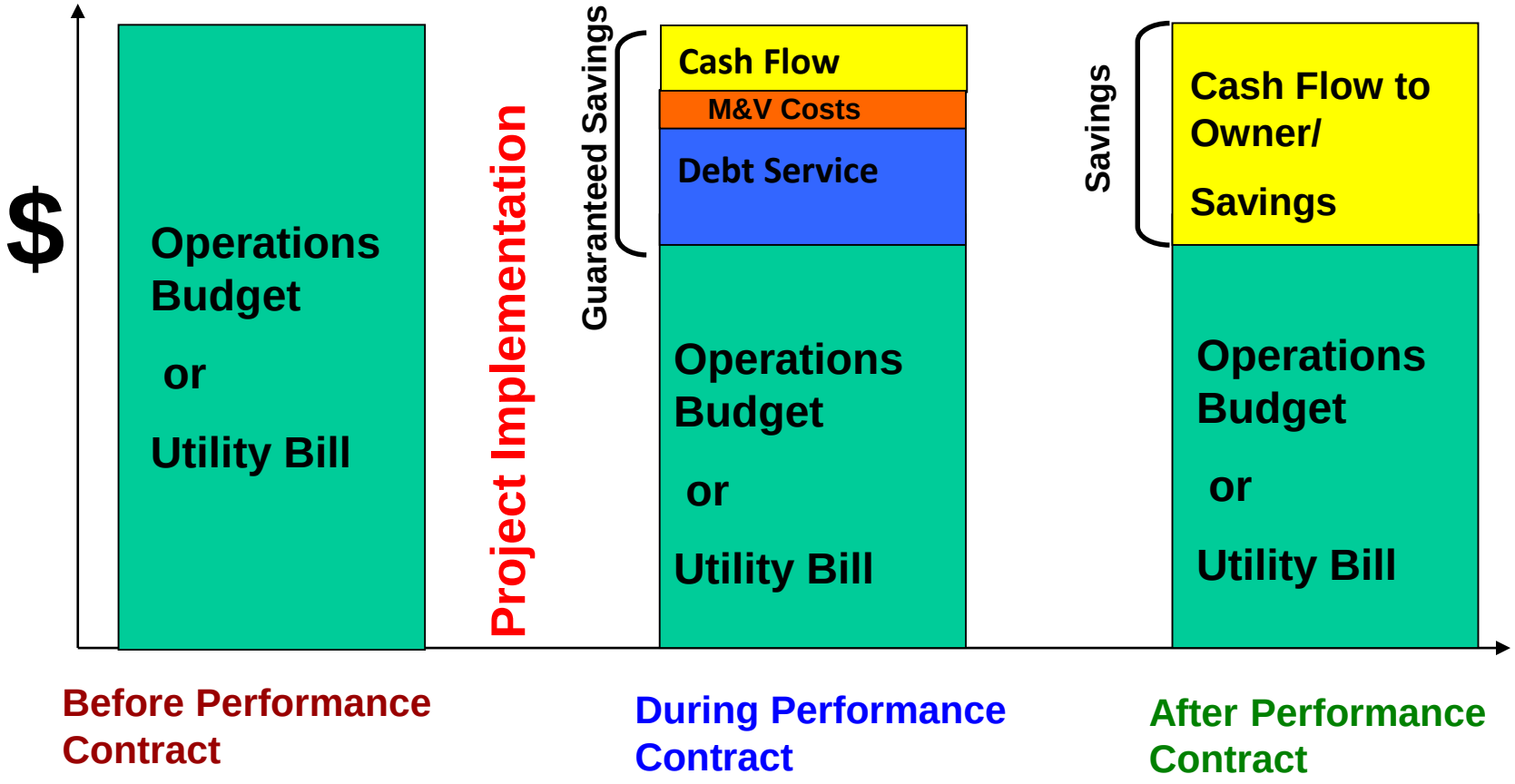


Before Improvements



After Improvements

Savings generated fund the project!


$
Operations Budget or Utility Bill
Project Implementation
Guaranteed Savings
Cash Flow
M&V Costs
Debt Service
Operations Budget or Utility Bill
Savings
Cash Flow to Owner/ Savings
Operations Budget or Utility Bill
Before Performance Contract
During Performance Contract
After Performance Contract

Performance Contracting Comparison

	Plan/Bid/Spec	**Performance Contracting**
Financial	Capital/Bond/Cash	**$$ You are already Spending – Operating Budget**
Relationship	Scope? Completion? Commissioned? Warranty…Gone	Continuous Partnership over life of contract
Upfront Fees	Yes	None
Performance & Financial Guarantee	None	Operational & Financial
Change Orders	Yes – Almost Always	Not Typically

Energy Management Success Stories: An ESCO Perspective and Kings Mountain, N.C.

Frank Shepard, PE, LEED AP

Consultant with Shultz Engineering Group;

Associate with Ally Engineering

Performance Contracting for Municipal Water Systems

City Of KINGS MOUNTAIN

FRANK SHEPARD, PE

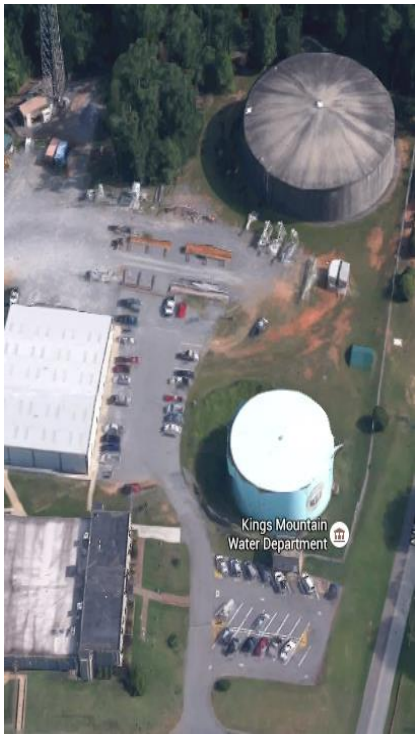
Getting Started

City first considered an AMR water meter project

Siemens met with the City Manager and the Mayor to discover challenges at the City

- Meter reading was not a big issue
- 40 year old over-sized water pumps and switchgear was the biggest issue and there were no funds available in the CIP to solve the problem
- Reduced water consumption made the current system oversized
- City Hall needed a new Chiller and control system
- Other goals

Reduce operating costs
- energy
- manpower
- maintenance



Feasibility Study

Stakeholders meeting brought together the people with the intimate knowledge

Data collection and site walk-thru's were conducted

A feasibility study resulted

- The big discovery was matching the electrical demand load to the Duke-Energy rate schedule
- The 9 Million gallon storage capacity and the 3 MGD usage created an opportunity
- The next important discovery was at the WWTP – also needed upgrades
- The City also wanted to provide air conditioning for youth GYM
- City Hall Chiller and controls
- Lighting and HVAC

Frank Shepard, PE Shepardpe@gmail.com 919 607-3925

The Audit

City Council approved a RFP for Performance Contracting

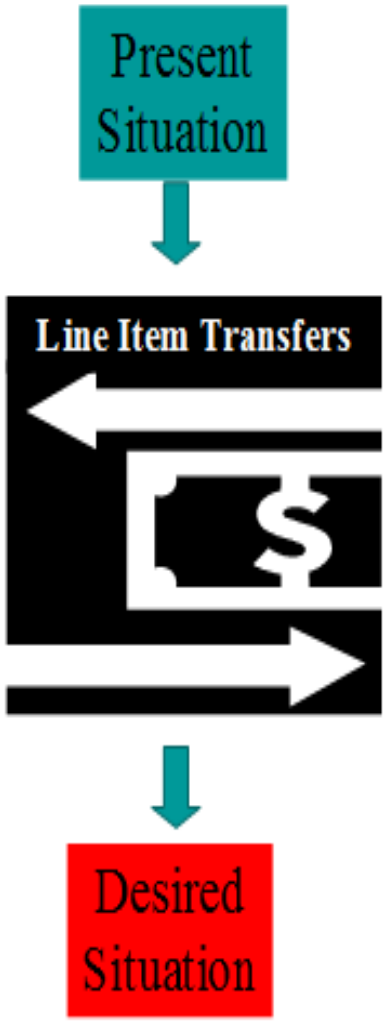
A non-proprietary RFP developed by the Energy Services Coalition was used for ESCO selection

An Investment Grade Audit was conducted.

- The City agreed to operate the water supply pumps off-peak resulting in significant savings
- These savings allowed the project to provide new pumps and switchgear more closely matched to the current load plus future growth considerations
- The WWTP changed the process slightly to provide fine bubble aeration equipment
- Inflow and infiltration was considered but not included > too costly
- City-wide lighting was included
- The City staff decided they could install the lighting if product was provided

Funding

- The City Finance Director contacted their financial advisor and brought in several banks to provide the Municipal Lease
- The project produced a positive cash flow based on a 12 year lease
- NC process required City Council and LGC approval
- City Council approved the final contract and construction began



Project Implementation

- The Gym units delivered were the wrong voltage
- The WWTP
  - The engineer of record passed away
  - State approval for the WWTP process change took a year
  - The WWTP equipment was delivered and remained uninstalled for several months
  - Operation produced too much noise
- The pumps at the main water plant and the booster plant were installed without water delivery interruption
- The City staff and the lighting supplier struggled with the correct applications and delivery
- The City Hall chiller and controls were a weekend change-out
- The new SCADA system for the water plant had IT interface issues
- 12 month schedule grew to 30


WWTP seemed remote but sound can travel in a quiet countryside.
Potts Creek
Potts Creek
Buffalo Creek
J-Pull-It
Andrew Jackson Hwy
2242
2242

Results

Finally, construction was completed – no change orders.

The ESCO corrected all issues. Savings have been achieved.

The budget was not directly affected – except that capital funds could go to other priorities.

Energy Management Success Stories: A Small Water System Perspective from Pickens, S.C.

Cory Cox

Public Utilities Director

City of Pickens, S.C.

The City of Pickens

Performance Contract

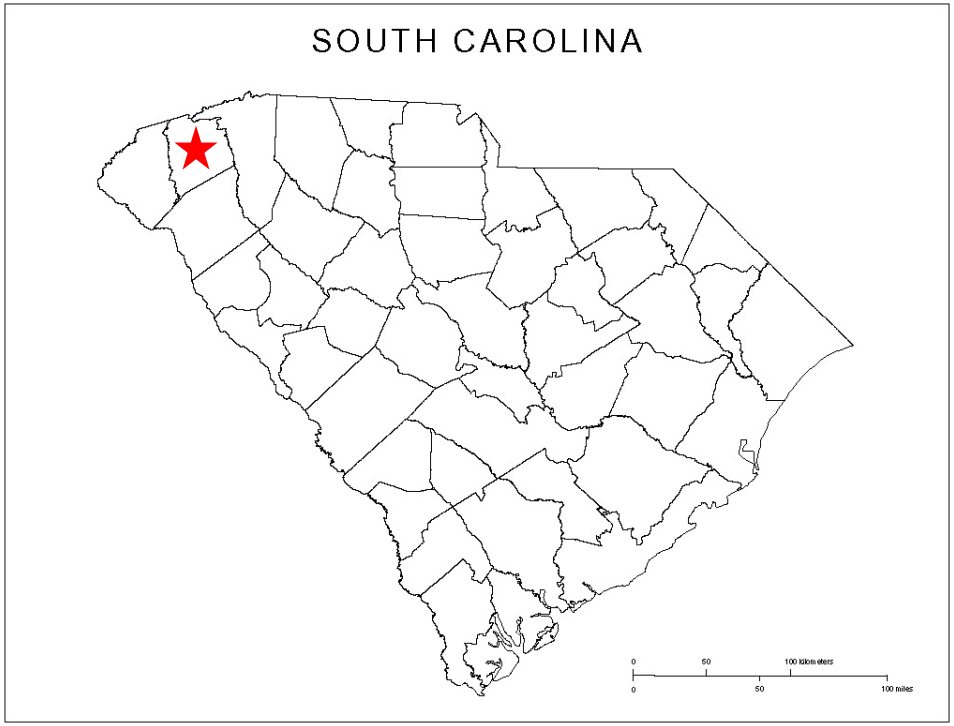
Cory Cox, PE
Public Utilities Director

City of Pickens
Where the Mountains Begin.

ESG ENERGY SYSTEMS GROUP

City of Pickens' Metrics

- Small, rural community approximately 45 min outside of Greenville SC
- ~5,000 water customers, ~2,200 sewer customers
- WTP with 4 MGD Capacity
- WWTP with 1 MGD Capacity
- ~$3MM Operating and Capital Budget



Basic Performance Contract Steps:

- The City issued a RFP for an ESCO with the basic project in mind to reduce operational and energy cost.
- Preliminary Audit
  - Distribution System, Collection System, Water Plant, Wastewater Plant
- Investment Grade Audit
- Contract Generation
- Construction Phase
- Review/Evaluation Phase (15 years)

The Project Scope (Distribution System):

- Master Meter Drive-by Radio Read AMR System
- Install (2) New 25 hp pumps at the Joy Rd Pump Station
- SCADA for the distribution system

The Project Scope (Water Plant):

- (2) new 300 hp finish pumps
- New 100 hp finish pump
- New chemical feed pumps
- (2) new 40 hp raw water pumps (Source 1)
- New 20 hp raw water creek pump (Source 2)
- SCADA overhaul

The Project Scope (Waste Water Plant):

- New influent course bar screen
- Replace jet pumps with large and fine bubble mixing/aeration

		Annual Utility Savings	Annual Operational Savings	Non-Annual Operational Savings	Captial Cost Avoidance	Revenue Increase	Total Benefit		Design	Cont.	Est. Construction Cost		Annual Service Fee
	ECM Description	$/Yr	$/Yr.	First Yr $	Total $	$/Yr.	$/Yr		($)	($)	($)		($/Yr.)
Water Meters Total		**$ -**	**$ 275,910**	**$ 26,540**	**$ -**	**$ 59,676**	**$ 362,126**		**$ -**	**$ 75,000**	**$ 1,151,491**		**$ 1,500**
Water Meters	AMR Metering Systems - Mastermeter	$ -	$ 275,910	$ 26,540	$ -	$ 59,676	$ 362,126		$ -	$ 75,000	$ 1,151,491		$ 1,500
Water Treatment Plant Total		**$ 13,662**	**$ 76,491**	**$ -**	**$ 390,000**	**$ -**	**$ 90,153**		**$ 62,900**	**$ 4,000**	**$ 990,411**		**$ -**
WTP	WTP Time of Day Rate	$ -	$ -	$ -	$ -	$ -	$ -		$ 10,500	$ -	$ -		
WTP	Replace Large Finish Water Pump	$ 9,496	$ -	$ -	$ 120,000	$ -	$ 9,496		$ 30,300	$ 1,000	$ 299,312		
WTP	Replace 100 HP Finishing Pump	$ 533	$ -	$ -	$ 65,000	$ -	$ 533		$ 1,250	$ 500	$ 60,872		
WTP	Replace 20HP Creek Pumping System	$ 801	$ 25,497	$ -	$ 45,000	$ -	$ 26,298		$ 4,250	$ 500	$ 70,389		
WTP	Replace (2) 40 HP Lake Pumps and Add High Influent Wet Well Section	$ 566	$ 25,497	$ -	$ 120,000	$ -	$ 26,063		$ 13,500	$ 500	$ 296,811		
WTP	Replace/Upgrade Chemical Feed Pump & Chlorinators	$ -	$ 25,497	$ -	$ 40,000	$ -	$ 25,497		$ 1,600	$ 1,000	$ 167,018		
WTP	New Joy Drive Pump	$ 2,266	$ -	$ -	$ -	$ -	$ 2,266		$ 1,500	$ 500	$ 96,009		
Waste Water Treatment Plant Total		**$ 13,609**	**$ -**	**$ -**	**$ 89,500**	**$ -**	**$ 13,609**		**$ 32,100**	**$ 5,500**	**$ 705,768**		**$ -**
WWTP	New Influent Pump and Alarm System	$ -	$ -	$ -	$ -	$ -	$ -		$ 600	$ -	$ -		
WWTP	Replace Existing Coarse Bar Screens	$ -	$ -	$ -	$ 18,000	$ -	$ -		$ 2,000	$ 500	$ 107,885		
WWTP	Replace Jet Pumps w/ Large and Fine Bubble Mixing/Aerations	$ 13,609	$ -	$ -	$ 71,500	$ -	$ 13,609		$ 25,000	$ 5,000	$ 597,883		
WWTP	Replace 3.5 Ton HVAC Unit	$ -	$ -	$ -	$ -	$ -	$ -		$ 2,000	$ -	$ -		
WWTP	Replace Trojan UV Disinfection System	$ -	$ -	$ -	$ -	$ -	$ -		$ 2,500	$ -	$ -		
SCADA System Upgrades		**$ -**	**$ 9,974**	**$ -**	**$ 100,000**	**$ -**	**$ 9,974**		**$ -**	**$ 3,000**	**$ 316,000**		**$ -**
SCADA	Install Additional SCADA Points	$ -	$ 9,974	$ -	$ 100,000	$ -	$ 9,974		$ -	$ 3,000	$ 316,000		
PROJECT TOTAL		**$ 27,271**	**$ 362,375**	**$ 26,540**	**$ 579,500**	**$ 59,676**	**$ 475,862**		**$ 95,000**	**$ 87,500**	**$ 3,163,670**		**$ 1,500**

Note: this was not the final project scope

Contract Details

- Total Cost $4,910,013
- Contract was designed around satisfying 14 Energy Control Measures (ECMs) during construction and the power saving after construction
- The descriptions of the ECMs in the contract are very vague.
  - “ESG will replace the existing 300 HP and 400 HP finish pumps with (2) new 300 HP finish pumps and premium efficiency motors. The new motors shall be inverter duty ready and installed with a variable frequency drive. Additionally, ESG will replace the existing high service finish water MCC with a new distribution panel.”
- The Contractor takes a lot of the risk
- **15 year contract** with ESG

How did we pay for it:

- Revenue Bond
- Largest bond the City has ever issued
- Third Party Financial Advisor - Optional
- Check in with Bond Attorney early in the process

Third Party Review:

- Reviewed our finances and ESG cost savings.
- U.A.N. Report
  - ESG Project Debt = ~$450,000/year
  - Debt coverage 1.72-1.82 over the next 5 years. (1.2 minimum for parity bonds)

Line	Description	Projected for Fiscal Year Ending April 30, 2015	2016	2017	2018	2019
	Operating Expenses					
	Water					
31	4300 Operations And Maintenance	$ 625,918	$ 643,540	$ 661,640	$ 680,340	$ 699,570
32	4320 Wastewater	0	0	0	0	0
33	4330 Water Plant	680,294	699,030	718,260	738,030	758,320
34	**Total Operating Expense-Water**	$ 1,306,212	$ 1,342,570	$ 1,379,900	$ 1,418,370	$ 1,457,890
	Sewer					
35	4300 Operations And Maintenance	$ 260,506	$ 267,860	$ 275,440	$ 283,200	$ 291,160
36	4320 Wastewater	283,141	290,970	298,980	307,230	315,720
37	4330 Water Plant	0	0	0	0	0
38	61 Stormwater Utility	12,000	12,310	12,630	12,950	13,290
39	**Total Operating Expense-Sewer**	$ 555,647	$ 571,140	$ 587,050	$ 603,380	$ 620,170
40	***Cost Savings Due to AMR Project***	***$ (61,300)***	***$ (238,534)***	***$ (242,279)***	***$ (246,134)***	***$ (250,097)***
41	**Total Water, Sewer Operating Expenses**	$ 1,800,559	$ 1,675,176	$ 1,724,671	$ 1,775,616	$ 1,827,963
42	**Income Available For Debt Service**	**$ 1,432,377**	**$ 1,696,399**	**$ 1,700,206**	**$ 1,653,919**	**$ 1,603,053**
	Debt Service	$ 76,219	$ 298,210	$ 301,955	$ 308,794	$ 312,757
	Parity Indebtedness					
43	Series 2010 Wtr & Swr Principal Bond	$ 116,618	$ 121,043	$ 125,636	$ 130,403	$ 135,351
44	WTP Bond Principal	159,552	165,870	172,438	179,267	186,366
45	2010 Wtr & Swr Interest	57,677	53,252	48,659	43,892	38,944
46	WTP Bond Interest	148,702	142,383	135,814	128,986	121,887
47	Series 2014 Revenue Bonds (ESG Capital Costs)	224,853	449,706	449,706	449,706	449,706
48	**Total Parity Debt**	$ 707,402	$ 932,254	$ 932,253	$ 932,254	$ 932,254
49	**Debt Service Coverage-Parity Debt**	*2.02*	*1.82*	*1.82*	*1.77*	*1.72*
50	**Remaining Net Revenue After Debt Service**	**$ 724,975**	**$ 764,145**	**$ 767,953**	**$ 721,666**	**$ 670,799**
	Other Expenses/Capital/Transfers					
51	WWTP Capital Improvement	$ 20,000	$ 44,500	**$ 10,000**	$ 120,000	$ 85,000
52	Sewer Collection System Capital	0	0	**0**	0	0
53	Wtr Plant Capital Improvement	5,000	58,000	**22,000**	7,000	0
54	Allocation To Contingent Fund	37,256	37,256	**37,256**	37,256	37,256
55	O&M Capital Equipment	0	0	**0**	0	0
56	O&M Capital Line Improvement	246,000	426,000	**233,000**	470,000	265,000
57	Stormwater Capital	100,000	100,000	**100,000**	100,000	100,000
58	New Sewer Line (Walmart S-100-12)	0	0	**0**	0	0
59	3 % Utility Transfer	140,000	140,000	**140,000**	140,000	140,000
60	**Total Other Expenses/Transfers Out/(In)**	$ 548,256	$ 805,756	**$ 542,256**	$ 874,256	$ 627,256
61	**Remaining Funds Available**	$ 176,719	$ (41,611)	$ 225,697	$ (152,590)	**$ 43,543**
	Funds Balance Activity					
62	Beginning Fund Balance	$ 565,000	$ 741,719	$ 700,108	$ 925,805	**$ 773,215**
63	Plus/(Minus) Remaining Funds Available	176,719	(41,611)	225,697	(152,590)	**43,543**
64	**ENDING AVAILABLE FUND BALANCE**	$ 741,719	$ 700,108	$ 925,805	$ 773,215	**$ 816,758**

The Take-Aways:

- Pros:
  - Performance contracts are an alternative funding mechanism that allow you to hit multiple aspects of your system all in one project
  - 1 project manager for the whole project
  - Set up in a design-build format
  - If we don’t see the power saving, ESG will cut us a check for the difference!

The Take-Aways:

- Cons:
  - A big chunk of our theoretical savings are operational savings and will not be fully realized.
  - Due to design-build format and performance guarantee initial cost is higher than traditional project formats

The Take-Aways:

- What We Learned:
  - The banks don’t care how much money it will save. They want to know if you can pay the loan without saving a dime.
  - Make sure you are conservative on the operational savings, Are you really going to fire that guy?
  - Don’t finance the project longer than the useful life of the equipment

Polling Question 4

Would you like to subscribe to the UNC Environmental Finance Center blog? *(choose one)*

- Yes
- No

Polling Question 5 and Evaluation Survey Link

Are you interested in receiving in-depth technical assistance for your small water system? *(choose one)*

- Yes
- No
- Would Like More Information About This

For More Information about ESPC:

- http://efc.web.unc.edu/2015/08/13/energy-savings-performance-contracting/
- http://www.naesco.org/
- https://www.naseo.org/
- http://web.ornl.gov/info/esco/legislation/newesco.shtml
- http://energy.gov/eere/slsc/energy-savings-performance-contracting
- http://www.epa.gov/greeningepa/energy/espc.htm

Thank You!

And please let us know if you have any questions.

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